At section 2 of the office action, claims 33-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Dvorkin* (U.S. Patent No. 6,381,471) in view of *Ahonen* (U.S. Patent No. 5,507,010).

In rejecting claim 33, the Examiner states that *Dvorkin* discloses a receive front-end module for use in a multi-band, multi-mode communication device. The Examiner admits that *Dvorkin* does not disclose at least two signal paths connected to the first feed points for simultaneously receiving communication signals in different frequency bands (from one of the antennas), but points to *Ahonen* for disclosing this feature.

Applicant respectfully disagrees.

Claim 33 comprises the following claim elements:

1) providing at least a first feed point and a second feed point, the first and second feed points adapted to connect separately to at least two of said plurality of electrically separated antennas (see preamble);
2) operatively connecting at least two of the signal paths to the first feed point for receiving communication signals through the first feed point, and at least a different signal path to the second feed point for receiving communication signals through the second feed point;
3) providing cross-band isolation between at least two of the signal paths;
4) the communication signals received in one of the signal paths connected to the first feed point and the communication signals received in the signal path connected to the second feed point being transmitted in the same frequency; and
5) the two signal paths connected to the first feed points adapted to receive communications signals in different frequency bands.

In rejecting claim 33, the Examiner states that *Dvorkin* discloses providing at least a first feed point 30, 31 and second feed point 32, 33, wherein the first and second feed points are separately connected to two antennas 4 and 5. The Examiner also states that *Dvorkin* discloses operatively connecting at least two signals paths to the first feed point 30, 31 for receiving communication signals and operatively connecting at least one signal path to the second feed point 32, 33 for receiving communication signals.

It is respectfully submitted that, in *Dvorkin*, while antenna 4 can be used for receiving communication signals, antenna 5 is not used for receiving communication signals because any received signals will be blocked by the power amplifiers 16 and 24, for example. Thus, if the first feed points are those connected to the antenna 4, then *Dvorkin* does not disclose operatively connecting at least one signal path to the second feed point for receiving communication signals. *Dvorkin* fails to disclose claim element No. 2. Accordingly, *Dvorkin* also fails to disclose claim element No.1. Moreover, *Dvorkin* does not disclose claim element No. 5, as admitted by the Examiner.

*Ahonen* discloses a receiver antenna 6 is connected via an associated preamplifier unit 15 and an antenna line 7 to a branching element 9 (col.3, line 59-64). *Ahonen* also discloses that a radio test unit 11 is connected between the antenna line 5 and 7 (col. 4, line 22-23; Figure 1). Thus, the transmit antenna 4 is not electrically separated by the receive antenna 6. Furthermore, *Ahonen* only disclosed only one signal path (between the switching unit 8 and the branching unit 9) connected to the receive antenna 6 for receiving communication signals. Thus, *Ahonen* fails to disclose claim elements No. 1 and No. 2. Accordingly, *Ahonen* also fails to disclose claim element No. 5.

On page 17 of the final office action, the Examiner states that it can be assumed that the other antenna and feed point, such as the transmit antenna and feed point, can also receive signals from inside the circuit.

It is respectfully submitted that, as shown in Figure 1 of *Ahonen*, only the signals in the transmit path (between the branching units 2 and 3) can be received by the receive path (between the switching unit 8 and branching unit 9) through radio test unit 11. There is no indication or suggestion in *Ahonen* that a signal path connected to the transmit antenna 4 and feed point can be used to receive signals from inside the circuit. *Ahonen* only discloses one signal path connected to the receive antenna through the first feed point for receiving communication signals.

Thus, *Ahonen* clearly fails to disclose or suggest the claim element No. 5.

Since both Dvorkin and Ahonen fail to disclose claim elements No. 1, No. 2 and No. 5, *Dvorkin*, in view of *Ahonen*, does not render claim 33 obvious.

Regarding claim 34, the Examiner states that *Dvorkin* teaches a multi-band, multi-mode communication device as claimed, except that *Dvorkin* does not teach the communication signals received in another different one of the signal paths connected to the first feed point transmitted in a different frequency band. The Examiner points to *Ahonen* for disclosing that feature.

Claim 34 comprises the following claim elements:

1) a plurality of electrically separated RF antennas, including a first antenna and a second antenna;
2) a front-end module having at least a first feed point and a second feed point, the first and second feed points separately to the first and second antennas;
3) a plurality of signal paths in the front-end module connected to the first and second feed points for receiving communication signals in a plurality of frequency bands;
4) the communication signals received in one of the signal paths connected to the first feed point and the communication signals received in the signal path connected to the second feed point being transmitted in the same frequency; and
5) the communication signals received in a different signal path connected to the first feed point being transmitted in a different frequency band.

In rejecting claim 34, the Examiner states that *Dvorkin* discloses a first antenna 4 and a second antenna 5 electrically separated from the first antenna. *Dvorkin* discloses at least a first feed point 30, 31 and second feed point 32, 33, wherein the first and second feed points are separately connected to two antennas 4 and 5. The Examiner also states that *Dvorkin* discloses a plurality of signal paths 40 and 42-22 operatively connected to the first and second feed points 30, 31, 32, 33 for receiving communication signals in a plurality of frequency bands.

It is respectfully submitted that, in *Dvorkin*, while antenna 4 can be used for receiving communication signals, antenna 5 is <u>not</u> used for receiving communication signals because any received signals will be blocked by the power amplifiers 16 and 24, for example. Thus, signal paths 42, 43 are irrelevant as to claim element No. 3 and claim element No. 4. For the same reason, antenna 5 is irrelevant to claim element No. 1 and claim element No. 2. The Examiner admits that *Dvorkin* also fails to disclose claim element No. 5 but points to *Ahonen* for disclose that feature.

Reading claim element No. 5 together with claim elements No. 2 and No. 4, claim element No. 5 simply means that two signal paths are connected to the first feed point for receiving communication signals in different frequency bands, wherein the first feed point is connected to the first antenna.

However, *Ahonen* only discloses one signal path (between the switching unit 8 and the branching unit 9) connected to a receiver antenna 6 for receiving communication signals. Thus, *Ahonen* fails to disclose claim element No. 5. Furthermore, *Ahonen* does not disclose or even suggest having a plurality of signal paths for receiving communication signals through the first and second feed points which are separately connected to two antennas. In that respect, *Ahonen* also fails to disclose claim elements No. 1, No. 2 and No. 3.

Since both *Dvorkin* and *Ahonen* fail to disclose claims elements No. 1, No. 2, No. 3 and No. 5, the combination of *Dvorkin* and *Ahonen* does not render claim 34 obvious.

At section 3 of the office action, claims 1-3 and 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Lahti* (U.S. Patent Application Publication No. 2002/0045427), in view of *Dvorkin* and further in view of *Ahonen*.

Claim 1 comprises the following claim elements:

1) a plurality of electrically separated antennas,
2) at least two feed points separately connected to two antennas for receiving communication signals, and
3) a plurality of signal paths connected to the feed points, at least two of the signal paths adapted for simultaneously receiving communication signals in a plurality of frequency bands from one of the antennas through one of the two feed points and, at least one different signal path adapted to receive communication signals from another one of the antennas through another of the two feed points in a further frequency band different from said plurality of frequency bands.

In rejecting claim 1, the Examiner states that *Lahti* teaches a receive front-end module for use in a multi-band, multi-mode communication device, the communication device having a plurality of electrically separated antenna 101a and 101b (Figure 2).

It is respectfully submitted that Figure 2 shows a polarization diversity receive front-end (paragraph [0010]). A diversity receive front-end uses two or more antennas to receive the same signal. The received signals through different antennas are then combined in order to increase the quality of a received signal. Diversity receive front-end modules are irrelevant to the claimed invention.

In Figure 2, the two antennas 101a and 101b have different polarization properties for receiving the same signal. After the signals received through the two antennas are processed in the RF blocks and the A/D converters, they are digitized and combined in the DSP block. In that respect, the antennas are not electrically separated and the communication device of Figure 2 is not a multi-band communication device.

The Examiner further states that *Lahti* discloses a plurality of signal paths, operatively connected to feed points for simultaneously receiving communication signals in a plurality of frequency bands (paragraph [0030], lines 1-4).

It is respectfully submitted that paragraph [0030] describes a different communication device. Paragraph [0030] is concerned with a polarization diversity receive front-end as shown in Figures 6, 7, 8 and 9. In each of the embodiments 800a, 880b of Figure 8 and those illustrated in Figures 6, 7 and 9, only one signal path is operatively connected to two polarization diversity antennas through a switch. Through the switch, the same signal with different polarization properties is alternately received through two antennas (see Figures 3 and 4; paragraph [0045], lines 19-22). So far as the above-mentioned embodiments are concerned, *Lahti* does not disclose a plurality of signal paths, operatively connected to the feed points for simultaneously receiving communication signals.

Regarding embodiment 800c, *Lahti* discloses a polarization diversity receive front-end having two linearly polarized antennas connected to a switch 810 which has two outputs. One of the outputs is directly connected to an RF block 812 and the other output is connected to the RF block 812 via a $90^{o}$ phase shifter. As such, both antennas can be coupled to the RF block simultaneously. With the phase shifter, the signal received through antenna 801b and conveyed to the RF block is the same as the signal received through antenna 801a and conveyed to the RF

block except for the phase shift. In that respect, the antennas 801a and 801b are no longer electrically separated and the signal paths through the two outputs of the switches are not for receiving signals in two different frequency bands.

On p.17 of the office action, the Examiner states that paragraph [0030] clearly states that two signal paths simultaneously receive signals (first four lines) and that spread-spectrum signals inherently imply frequency hopping and spread-spectrum signals are received in different frequency bands.

It is respectfully submitted that the first four lines of paragraph [0030] recite that "In addition, a method or receiver according to the invention is suitable for receiving simultaneously many spread-spectrum radio signals having different polarization properties." The word "simultaneously" here applies to "many spread-spectrum radio signals". In a non-diversity spread-spectrum receive front-end, a single antenna with a single signal path can be used to simultaneously receive many spread-spectrum radio signals. Although spread-spectrum radio signals are signals corresponding to various spreading codes or channels, they are all in the same frequency band (lines 4-9, paragraph [0030]). *Lahti* extends the spread-spectrum technique to a polarization diversity receive front-end. As such, a spread-spectrum radio signal corresponding to the same spreading code can be received through two polarization antennas with different polarization properties. Similarly, spread-spectrum radio signals received through any one of the antennas may have different spreading codes but the same polarization property (lines 20-23, paragraph [0030]).

In sum, in the embodiment 800c of Figure 8 and the receive front end of Figure 2, the antennas are not electrically separated because the signals simultaneously received through two different antennas must be combined in a DSP or an RF block. Furthermore, the signals received through two different antennas are the same signal in the same frequency band but with different polarization properties. In the embodiments 880a, 880b of Figure 8 and those illustrated in Figures 6, 7 and 9, the antennas are used to alternately receive signals of the same frequency band but in different polarization properties. Thus, none of the embodiments as disclosed in *Lahti* meets all three claim elements of claim 1 as listed above.

Furthermore, the Examiner cites *Dvorkin* for disclosing providing cross-band isolation but admits that the combination of *Lahti* and *Dvorkin* fails to disclose at least two of said plurality of signal paths adapted to simultaneously receive communication signals from one of

the antennas through one of the two feed points. The Examiner points to *Ahonen* for disclosing that feature.

It is respectfully submitted that *Ahonen* only discloses one signal path between the switching unit 8 and the branching unit 9 for receiving communication signals from the antenna 6

Thus, the combination of teachings in *Lahti*, *Dvorkin* and *Ahonen* does not render claim 1 obvious.

As for claims 2, 3 and 6-10, they are dependent from claim 1 and recite features not recited in claim 1. For reasons regarding claim 1 above, claims 2, 3 and 6-10 are also distinguishable over the cited *Lahti*, *Dvorkin* and *Ahonen* references.

At section 5, claims 13-15 are rejected are rejected under 35 U.S.C. 103(a) as being unpatentable over *Dvorkin* in view of *Ahonen* and further in view of *Gitlin et al.* (U.S. Patent No. 6,188,718, hereafter referred to as *Gitlin*). The Examiner cited *Gitlin* for disclosing a third antenna.

At section 6, claims 4, 5, 11, 12 and 16-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Dvorkin*, *Ahonen*, and *Gitlin*, in view of *Ella* (U.S. Patent Application Publication No. 2003/0128081). The Examiner cited *Ella* for disclosing one or more baluns.

It is respectfully submitted that claims 4, 5, 11-15 and 16-32 are dependent from claims 1 and 34 and recite features not recited in claims 1 and 34. For reasons regarding claims 1 and 34 above, these dependent claims are also distinguishable over the cited *Lahti*, *Dvorkin*, *Ahonen*, *Gitlin* and *Ella* references.

## CONCLUSION

Claims 1-36 are allowable. Early allowance of claims 1-36 is earnestly solicited.

Respectfully submitted,

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